

Chapter 8

Resource Estimate for Superfund Implementation

Section 301(h)(1)(G) of CERCLA requires EPA to estimate the resources needed by the federal government to complete Superfund implementation. The Agency interprets this requirement to be a report on the cost of completing cleanup at sites currently on the National Priorities List (NPL). Much of this work will occur after FY93.

Section 8.1 of this chapter includes annual information on Trust Fund resources obligated by EPA and other federal departments and agencies through FY93. An overview of the method used to estimate the long-term costs associated with site cleanup is contained in Section 8.2, and an estimate of the long-term costs of cleaning up sites on the existing NPL is contained in Section 8.3. The estimate includes Trust Fund resource projections for EPA and other federal departments and agencies funded through the Trust Fund for FY94 and beyond. The estimate does not include the cost incurred by other federal agencies to clean up their sites, or potentially responsible party (PRP) contributions. Finally, Section 8.4 provides information submitted to EPA by other federal departments and agencies on their resource needs (from the Trust Fund and within their agency budgets) from FY90 through FY93, and describes their Superfund activities.

The long-term estimate provided in Section 8.3 is based primarily on the resources required to carry out the responsibilities and duties assigned to EPA and other federal departments and agencies by Executive Order 12580. To compute the estimate, EPA must make assumptions about the size and scope of the Superfund program, the nature and number of response actions, the level of participation

by states and private parties, and the increasing use of treatment technologies. For active NPL sites (those that have reached or passed the remedial investigation/feasibility study (RI/FS) planning stage), these assumptions relate to management of the workload already in the remedial pipeline and the costs of those actions. For NPL sites that have not yet entered the RI/FS planning stage, assumptions are made about which activities will be necessary to clean up the sites and delete them from the NPL.

In developing the long-term resource estimate, EPA considered several sources of information:

- EPA Superfund budgets for FY90 through FY93, including budget requests from other federal departments and agencies;
- Data submitted to EPA by other federal departments and agencies under an approved General Services Administration (GSA) Interagency Report Control Number, issued on February 5, 1988, as required under the provisions of 41 CFR Part 201-45.6;
- The Federal Agency Hazardous Waste Compliance Docket developed under Section 120(c) of CERCLA and each federal department's and agency's annual report to Congress on federal facility cleanup as required under Section 120(e)(5) of CERCLA; and
- Various EPA information systems, primarily the CERCLA Information System (CERCLIS) and the Integrated Financial Management System.

Acronyms Referenced in Chapter 8	
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLIS	CERCLA Information System
CA	Cooperative Agreement
CD	Consent Decree
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DOJ	Department of Justice
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GSA	General Services Administration
IAG	Interagency Agreement
MARAD	Maritime Administration
NASA	National Aeronautics and Space Administration
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NIEHS	National Institute of Environmental Health Sciences
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
NRT	National Response Team
OLM	Outyear Liability Model
OSHA	Occupational Safety and Health Administration
PRP	Potentially Responsible Party
RA	Remedial Action
RD	Remedial Design
ROD	Record of Decision
RRT	Regional Response Team
RI/FS	Remedial Investigation/Feasibility Study
RSPA	Research and Special Programs Administration
TCE	Trichloroethylene
TVA	Tennessee Valley Authority
USDA	United States Department of Agriculture
USCG	United States Coast Guard
VA	Department of Veterans Affairs

Specifically, EPA has estimated resource needs for FY94 and beyond. The Agency is working to improve data quality, refine cost estimating methods, and collect additional information. This long-term effort has been coordinated with the development of the FY95 budget. In conjunction with the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and its policies affecting program direction and scope, EPA is moving closer to a more complete cost estimate for implementing CERCLA. The results of this effort are presented in Section 8.3 of this chapter.

EPA's ability to project the federal resource requirement for CERCLA implementation improves each year as more experience is gained. Improved coordination with other federal departments and agencies and additional data on the implementation

of the federal facilities requirement of Section 120 will also increase the accuracy of future resource estimates.

8.1 SOURCE AND APPLICATION OF RESOURCES

Since the enactment of CERCLA in 1980, Congress has provided Superfund with \$11.9 billion in budget authority (FY81 through FY93). This estimate includes \$1.7 billion for FY81 through FY86, and \$10.2 billion for the post-SARA period, FY87 through FY93. The FY93 budget allocated total resources of \$1.6 billion for the following activities:

- *The Response Program* uses 77 percent of Superfund resources. Response program activities include site assessment (7%), time-critical and non-time-critical removals (15%), long-term clean-up actions (33%), and program implementation activities (13%). Also included is support provided by the Office of Water, the Office of Air and Radiation, and other federal agencies (9%).
- *The Enforcement Program* uses 11 percent of Superfund resources. Enforcement activities include PRP negotiations, litigation, and settlements and cost recovery efforts.
- *Management and Support* uses 8 percent of Superfund resources. This category includes program analysis provided by the Office of Program Planning and Evaluation, personnel, contracting and financial management services from the Office of Administration and Resources Management, legal services provided by the Office of General Counsel, and the audit function provided by the Office of the Inspector General.
- *Research and Development* uses 4 percent of Superfund resources for the study and validation of new environmental technologies.

Exhibit 8.1-1 presents a snapshot of the allocation of Superfund resources for FY92 and FY93 within these categories.

Exhibit 8.1-1
EPA Superfund Obligations
(in Millions)

Program Area	FY92 Actuals	FY93 Actuals
Response Program (Total)	\$1,349.6	\$1,224.2
EPA	1,195.6	1,071.0
Other Federal Agencies	154.0	153.2
Enforcement Program	190.1	173.0
Management and Support	121.0	123.5
Research and Development	65.8	64.1
TOTAL SUPERFUND	\$1,726.5	\$1,584.8

Source: Superfund Budget Documentation.

51-037-2B

8.1.1 Estimating the Scope of Cleanup

Site cleanup is the single largest category of Superfund expenditures and is expected to remain so in the future. To project EPA funding needs for clean-up activities, several key estimations were made, including

- The projected number and average cost of studies, remedial designs (RDs), and remedial actions (RAs) undertaken;
- The extent and cost of removal activity; and
- The proportion of direct clean-up actions undertaken by PRPs.

8.1.2 PRP Contributions to the Clean-Up Effort

The most significant way PRPs contribute to the hazardous substance clean-up effort is by undertaking and financing remedial activities (whether voluntarily or under order). When PRPs finance site clean-up efforts, potential EPA Superfund obligations for those sites are dramatically reduced and the remaining principal cost is PRP oversight. EPA continues to develop and implement policies designed to

encourage PRP cleanups.

In addition to remedial and removal actions actually undertaken by PRPs, a portion of the costs of certain Fund-financed response actions will be recovered from PRPs through enforcement activities. Typically, there are significant delays between expenditures from the Trust Fund and recovery of costs.

8.2 RESOURCE MODEL ASSUMPTIONS

Estimating the cost of cleaning up current NPL sites depends on a number of factors, many of which will change as the program continues to mature. The main factors are

- Changes in Superfund program policies and procedures because of the revised NCP, particularly the clean-up standards as required under Section 121 of CERCLA;
- Changes in the remedial program because of revisions to the Hazard Ranking System, as required under Section 105 of CERCLA;
- The long period required to identify, develop, select, and construct a remedy, and the need for scheduling flexibility to maximize the impact of enforcement activities;
- The level of state Superfund program activity;
- The level of PRP participation in the program;
- Changes in clean-up approaches, such as implementing more early actions in favor of remedial actions; and
- The nature of and demand for removal actions.

Based on these factors, EPA uses the Outyear Liability Model (OLM) to estimate the long-term resource needs of Superfund. The OLM provides meaningful long-range forecasts, has the flexibility to refine forecasts, and can be adjusted for a large number of program-related variables. These variables can be individually adjusted to reflect actual or anticipated changes in the program.

The four primary cost categories used in the

OLM to estimate the long-term resources required to clean up the existing NPL are

- Active NPL sites;
- NPL sites where the remedial process has not yet begun;
- Non-site activities; and
- RA costs.

EPA's estimate of resources required to clean-up the existing NPL sites is provided in Section 8.3. To develop this estimate, the Agency has concentrated on the remedial and removal programs. These programs are the major components of the Superfund program and account for the majority of Fund expenditures by the Agency.

8.2.1 Active NPL Sites

Remedial efforts are underway at most of the sites on the current NPL. Remedial plans are being developed for the remaining sites on the NPL, leaving only 77 sites on the existing NPL that were inactive at the end of FY93.

Data on the active NPL sites are stored in CERCLIS and incorporated into the OLM to present the most accurate picture of planned activities. The OLM estimates ancillary activities for sites at which some level of planning or remediation activity is underway. Because most of the existing NPL sites are active, they constitute a large portion of the total liability estimate.

In addition to planned remedial activities, enforcement activities have a significant impact on the costs of addressing Superfund sites. All enforcement activities are estimated by the Model according to past program experience and several standard sequences of activities, each representing a different enforcement approach. Enforcement-related variables within the Model include costs, workyears, and the shift in remedial costs when Superfund assumes responsibility from, or passes responsibility to, a PRP. As with remedial activities, most enforcement costs and workyears are estimated.

8.2.2 Sites Yet to Begin the Remedial Process

The OLM uses the same general approach for sites where the remedial process has yet to begin. Cleaning up an NPL site involves a number of different activities occurring over time and in predictable arrangements. For sites where the remedial process has yet to begin, the OLM must first approximate the activities that will be involved when remediation of the sites begins. Approximations are made by applying several "generic" activity sequences to the number of sites being estimated. When the activities have been set, cost and workyear pricing factors are applied to estimate the necessary resources. A consistent approach is used for all site activities, both remedial and enforcement. In the approach, tradeoffs such as avoiding clean-up costs but incurring PRP oversight costs are handled automatically as assumptions are adjusted.

The OLM includes a library of different activity sequences. Each sequence represents a "typical" site and involves different activities, durations, and schedules. In addition to the key activity starts discussed above, the OLM includes a number of other factors to control the mix of these activity sequences.

8.2.3 Non-Site Costs

Although non-site activities comprise a substantial portion of the budget, individually they are fairly small and stable. For these reasons, resource needs for these activities are estimated by applying annual factors to the levels included in the requested budget for the current year.

Aside from the number of sites requiring cleanup and the cost of individual cleanups, the assumption of managerial and financial responsibility for a site has the largest potential impact on the cost of the Superfund program. There are many factors involved in establishing who is responsible for a site (referred to as the site "lead"), including

- Level of emphasis on the enforcement program;

- Willingness of states to assume financial responsibility; and
- Cost-sharing arrangements between Superfund and the states and between Superfund and the PRPs.

The Model accommodates each of these factors with one or more variables, allowing the estimation of Superfund liabilities across a wide range of site-lead and cost-sharing scenarios. Site variables include

- Proportion of sites addressed by each lead category (Fund, PRP, state, and state enforcement);
- Number of sites that are owned and/or operated by state or local governments; and
- Number of sites that follow each of several enforcement paths.

Choices among these variables generally affect both cost and duration of the program. Increases in PRP leads will ultimately result in lower Fund costs, but related litigation will substantially extend the amount of time required to reach deletion of the sites from the NPL.

8.2.4 Factors Related to Remedial Action Costs

The method of estimating RA costs is based on analysis of the records of decision (RODs) signed from FY87 through FY93. A statistical analysis of RA cost estimates contained in these RODs identified eleven distinct cost patterns based on the choice of remedial technology. For each technology type, there is a unique average cost and expected treatment volume. These factors, together with the expected usage of each technology, control the RA cost module of the OLM.

Adjustments within the RA cost module make it possible to estimate the fiscal impact of

- Policies affecting the selection of technological approach (e.g., using more treatment and less containment);

- Changes in the contaminants found on site (e.g., if remaining sites have higher levels of heavy metals than prior sites, incineration would be less effective);
- Changes in technology costs; and
- Changes in site size.

8.3 ESTIMATED RESOURCES TO COMPLETE CLEANUP

As illustrated in Exhibit 8.3-1, EPA's estimate of the total Trust Fund liability to complete cleanup of existing NPL sites is \$27.7 billion. This total includes the OLM long-term estimate of \$15.8 billion for FY94 and beyond. Major assumptions shaping the long-term estimate are as follows:

- Only the Trust Fund cost of the current sites proposed to or listed on the NPL (1,320 sites, including 1,197 final, 71 proposed, 1 deferred, and 51 deleted sites as of September 30, 1993) is included.
- Removal activities at sites on the NPL remain at current levels.
- RA cost factors (choice of technology, site size, and technology cost) result in an estimated cost of \$12.2 million per RA.
- Program support and other non-site elements are straightlined at the levels of the current request year budget (FY95 President's budget).
- Approximately 35 percent of all new RI/FS starts will be Fund-financed (i.e., the Trust Fund will pay at least 90 percent of the cost).
- For non-federal facility sites, PRPs will take the lead on 70 percent of the RAs. (Because oversight is significantly less expensive than cleanup, Fund costs drop dramatically when PRPs assume financial responsibility for more cleanups.)
- No resource and programmatic assumptions for federal facility sites are included in the OLM. The OLM does not generate a resource estimate

Exhibit 8.3-1
Estimate of Total Trust Fund Liability
to Complete Cleanup
at Sites on the
National Priorities List
(in Billions)

	Total Allocations
FY93 and Prior	\$11.9
FY94 and beyond	15.8
TOTAL	\$27.7

Source: Superfund Budget Documentation and Outyear Liability Model. 51-037-3C

for the federal facility program.

Assumptions about the future reflect planning assumptions from the *Superfund Program Management Manual* and historical performance averages, both of which are revised periodically. EPA will continue to monitor developments that affect program costs. Changes will be incorporated into the model as they occur, improving depiction of future programmatic direction and refining previous analysis. OLM estimates will vary over time, as a result, and subsequent editions of this Report will most likely contain revised estimates.

8.4 ESTIMATED RESOURCES FOR OTHER EXECUTIVE BRANCH DEPARTMENTS AND AGENCIES

The second element in fulfilling the requirements of Section 301(h)(1)(G) of CERCLA is providing an estimation of the resources needed by other federal departments and agencies. The Superfund resource needs of the other Executive Branch departments and agencies are met through two sources: the Superfund Trust Fund and the individual federal department's or agency's budget.

Trust Fund monies are provided to other federal departments and agencies through two mechanisms:

- *Interagency Budgets:* EPA provides Trust Fund monies to other federal departments and agencies that support EPA's Superfund efforts. Transfers are accomplished through an interagency budget under Executive Order 12580.
- *Site-Specific Agreements:* EPA also provides money from the Trust Fund to other federal departments and agencies through site-specific agreements.

Federal departments and agencies also provide support to Superfund activities through CERCLA-specific funds and general funds of the department or agency. Exhibit 8.4-1 summarizes reported expenditures (both Trust Fund and agency funds) of other federal departments and agencies. There are no projections of future needs available for other agencies. The information below was provided by the respective departments and agencies to describe their resource needs and Superfund activities.

Department of Agriculture

The U.S. Department of Agriculture (USDA) initiated a special program in FY88 to achieve compliance with the statutory and regulatory requirements of CERCLA. The program includes preassessment, assessment, removal, and remedial activities at USDA facilities throughout the United States.

The USDA has more than 100 sites listed on the Federal Agency Hazardous Waste Compliance Docket. None of these sites are currently listed on the NPL, but several have been proposed for listing. The USDA sites on the docket are primarily the responsibility of the Agricultural Research Service, Farmers Home Administration, and Forest Service. Other USDA agencies, including the Animal Plant and Health Inspection Service, Commodity Credit Corporation, Food Safety Inspection Service, and Soil Conservation Service, also have a small number of CERCLA activities underway.

In general, USDA agencies have completed an inventory and discovery process for USDA-owned facilities or managed lands with the following exceptions:

- The Forest Service has not completed an

Exhibit 8.4-1
CERCLA Resource Needs and Interagency Funding for Other Federal Departments and Agencies

(Dollars in Millions)

Federal Departments and Agencies	FY90 Actual		FY91 Actual		FY92 Actual		FY93 Actual		FY90-FY93 Total	
	Trust Fund	Agency Budget	Trust Fund	Agency Budget	Trust Fund	Agency Budget	Trust Fund	Agency Budget	Trust Fund	Agency Budget
Agriculture	--	13.3	--	12.8	--	27.7	--	13.3	--	67.1
Commerce (NOAA)	2.2	0.9	2.2	1.1	2.2	1.3	1.1	1.8	7.7	5.1
Defense	--	601.3	--	1,065.0	--	1,129.4	--	1,638.6	--	4,434.3
Energy	--	431.6	--	1,000.0	--	1,444.6	--	1,150.2	--	4,026.4
FEMA	1.7	1.0	1.7	1.4	1.8	--	.9	--	6.1	2.4
General Services Administration	--	--	--	--	--	0.4	--	0.7	--	1.1
Health and Human Services										
ATSDR	45.2	--	48.5	--	56.5	--	60.0	--	210.2	--
NIEHS	36.3	--	41.9	--	51.1	--	51.9	--	181.2	--
Interior	1.1	34.1	1.2	59.0	1.2	70.4	0.8	62.0	4.3	225.5
Justice	28.8	--	32.8	--	35.5	--	33.3	--	130.4	--
Labor (OSHA)	1.0	--	0.7	--	0.7	--	0.4	--	2.8	--
NASA	--	5.7	--	3.9	--	2.4	--	5.5	--	17.5
Tennessee Valley Authority	--	--	--	--	--	4.3	--	3.4	--	7.7
Transportation	--	7.3	--	12.5	--	20.5	--	21.0	--	61.3
Veterans Affairs	--	12.0	--	2.0	--	2.0	--	2.0	--	18.0
Total	116.3	1107.2	132.5	2,157.7	149.2	2,703.0	148.3	2,898.5	546.3	8,866.4

Source: Office of Program Management.

51-037-4C

inventory of potential problems on the 190 million acres of land it manages with respect to abandoned mining sites or closed sanitary landfills. Most of these sites are located on national forest lands and are the result of third-party activities that occurred in the past under authorizing statutes, regulations, or permits. Cleanup at these sites might involve cost recovery from PRPs.

- The Forest Service acts on behalf of the Secretary of Agriculture as a federal trustee for natural resources on lands it manages that have been damaged by releases of hazardous substances. The inventory of such sites has not yet been

established. As a trustee for natural resources, the Forest Service acts for USDA in providing support and assistance to the National Response System through the National Response Team (NRT) and Regional Response Teams (RRTs).

Department of Commerce

The National Oceanic and Atmospheric Administration (NOAA) carries out many of the responsibilities of the Department of Commerce under CERCLA. NOAA's CERCLA goals are to reduce risks to coastal habitats and resources from hazardous chemical releases through preparedness

and response activities; protect and restore NOAA trust habitats and resources affected by hazardous waste sites in coastal areas; and advance the state of knowledge about hazardous material interactions in coastal environments through research, development, and technology transfer.

NOAA accomplishes these goals through two networks of regional coordinators:

- NOAA's Coastal Resource Coordinators work with EPA to evaluate natural resource concerns at coastal hazardous waste sites and ensure coordination among state and federal natural resource trustees. This work is funded largely through CERCLA. When threats to natural resources cannot be addressed through CERCLA remedial actions, NOAA may seek to repair natural resource damages through its Damage Assessment and Restoration Program. This program is funded separately from CERCLA.
- NOAA's Scientific Support Coordinators provide the U.S. Coast Guard (USCG) and EPA On-Scene Coordinators with scientific and technical expertise in planning for and responding to oil and hazardous material releases. Scientific Support Coordinators, whose work is funded by NOAA, seek to mitigate the effects of releases into coastal areas.

NOAA also undertakes site-specific clean-up actions at facilities under its control. This program is relatively new within the agency; NOAA began receiving money for this specific program in 1993. Funding increases in this area are directly related to the number of NOAA sites that are added to the Federal Agency Hazardous Waste Compliance Docket.

Department of Defense

The Department of Defense (DOD) has the authority and responsibility under CERCLA to clean up contamination associated with past DOD activities. In 1984, DOD increased its emphasis on hazardous waste cleanup when Congress established the Defense Environmental Restoration Program. Under this program, DOD identifies, investigates, and cleans up environmental contamination from past DOD

activities. DOD is responsible for remediating such contamination in accordance with the procedures of the NCP.

At the close of FY93, DOD identified more than 19,500 sites on more than 1,800 installations with the potential for contamination. DOD is committed to cleaning up contaminated sites.

Department of Energy

The Department of Energy (DOE) is committed to conducting its operations in a safe and environmentally sound manner and to preventing, identifying, and correcting environmental problems during present and future operations.

DOE has issued guidance establishing policies and procedures for clean-up activities conducted under CERCLA. DOE has also developed a Five-Year Plan that will be updated annually and will integrate planning for corrective activities, environmental restoration, and waste management operations at its facilities. DOE conducts assessments at its operating facilities to monitor environmental compliance and follow up on findings. Compliance with environmental laws, regulations, and requirements, an integral part of operations at DOE facilities, ensures that risks to human health and the environment posed by past, present, and future operations are eliminated or reduced to safe levels.

During FY93, DOE made significant progress in reaching and amending agreements with regulatory entities, undertaking clean-up actions, and initiating measures to prevent future environmental problems. In accordance with CERCLA Section 120, DOE continued remedial activities at all 17 DOE sites listed on the NPL, including removal actions, interim actions, and the initiation of final remediation activities. The 17 DOE NPL sites are Brookhaven National Laboratory Site, New York; Fernald Environmental Management Project (formerly known as Feed Materials Production Center), Ohio; Hanford Site, Washington; Idaho National Engineering Laboratory Site, Idaho; Lawrence Livermore National Laboratory-Main Site, California; Lawrence Livermore National Laboratory-Site 300, California; Maywood Site, New Jersey; Monticello Mill Site, Utah; Monticello Vicinity Properties, Utah; Mound

Plant, Ohio; Oak Ridge Reservation, Tennessee; Rocky Flats Plant, Colorado; Ross Complex, Washington; Savannah River Site, South Carolina; St. Louis Site, Missouri; Wayne Site, New Jersey; and Weldon Spring Site Remedial Action Project, Missouri. Since 1990, no additional DOE facilities have been listed on the NPL, and only two sites (Pantex Plant, Texas, and Paduch Site, Kentucky) have been proposed for listing.

During FY93, DOE executed one CERCLA Section 120 interagency agreement (IAG) for the Savannah River Site, South Carolina. DOE and EPA also renegotiated existing IAGs for Mound Plant, Ohio; the Weldon Spring Site, Missouri; and the Hanford Site, Washington.

Federal Emergency Management Agency

The enactment of SARA in 1986 made many of the voluntary preparedness and planning activities of the Federal Emergency Management Agency (FEMA) ineligible for funding under the Superfund budget after September 30, 1987.

To continue the ongoing Superfund assistance to state and local governments and to support efforts to implement Title III of SARA, FEMA consolidated funding requests under two separate appropriation authorizations. Funding for Superfund activities was requested under the Superfund interagency budget. The remainder of FEMA's hazardous materials clean-up coordination activities, including those authorized by SARA Title III, was incorporated into FEMA's own operating budget (under its technological hazards budget). Since FY87, no additional funds have been requested under CERCLA Section 301(h)(1)(G) to carry out Superfund activities.

Funding received under Superfund is used to provide guidance, technical assistance, and interagency coordination for FEMA and for multi-agency initiatives that support state and local responsibilities under Superfund. Interagency coordination is accomplished primarily through the NRT/RRT structure. FEMA chairs the NRT preparedness and training committees and provides staff support to the NRT, RRTs, and supporting subcommittees.

FEMA activities in support of state and local

governments include furnishing guidance in the design and development of hazardous material exercises to include jurisdictions within and around Superfund sites; providing guidance in the development and revision of hazardous material plans addressing Superfund issues to ensure their adequacy and consistency with the NCP; supplying training and course materials for constituencies involved in various Superfund clean-up activities; supporting the NRT-sponsored National Hazardous Materials Conference to coordinate efforts for improving hazardous material emergency preparedness nationwide; and completing the temporary and permanent relocation programs started in FY91 (e.g., Times Beach, Forest Glenn).

General Services Administration

Resources for environmental studies and corrective projects are included in the GSA budget and can be used for CERCLA studies/corrective projects, if necessary. GSA does not have any sites on the NPL, though it has initiated and completed cleanups at non-NPL sites.

Department of Health and Human Services

Within the Department of Health and Human Services, the Agency for Toxic Substances and Disease Registry (ATSDR) and the National Institute of Environmental Health Sciences (NIEHS) perform CERCLA activities.

Agency for Toxic Substances and Disease Registry

ATSDR's mission is to prevent or mitigate adverse human health effects and diminished quality of life resulting from exposure to hazardous substances. ATSDR is charged under CERCLA with various responsibilities including performing public health assessments and emergency response actions; initiating health studies, and maintaining surveillance and registries; profiling toxic substances; and educating the public about health risks.

ATSDR significantly expanded its approach to conducting health assessments during the fiscal year. When performing assessments, ATSDR focuses on involving communities, establishing public health

action plans, and allowing a public comment period. Also in 1993, ATSDR prepared the following public health assessment documents: preliminary health assessments (23 initial release documents, 14 public comment release documents, and 13 final release documents); full health assessments (16 initial release documents, 73 public comment release documents, and 51 final release documents); and petitioned health assessments (13 initial release documents, 15 public comment release documents, and 8 final release documents). ATSDR also conducted 193 site reviews and updates.

During the fiscal year, ATSDR issued Health Advisories at the following sites: Raymark Industries and the Stratford Asbestos sites, Stratford, Connecticut; North Drive Dump Site/Wyandotte Cyanide Site, Wyandotte, Michigan; and Tennessee Products Site, Chattanooga Creek, Tennessee. At EPA's request, ATSDR personnel and staff evaluated 64 RODs to determine whether the proposed remedial alternatives would minimize existing and future impacts of the sites on public health.

ATSDR's emergency response staff are responsible for providing health-related technical support to federal, state, and local responders during emergencies caused by the release of hazardous substances. ATSDR Emergency Response Coordinators have immediate access to a wide variety of professional experts including chemists, toxicologists, environmental scientists, and medical professionals. Through its cooperative agreement (CA) program, ATSDR supported emergency response activities in nine state health departments, improving the capacity of participating states to respond to an emergency involving hazardous substances. In addition, during the fiscal year ATSDR staff

- Prepared approximately 500 health consultations and provided technical assistance to address approximately 400 other requests from EPA and other federal, state, and local agencies and organizations;
- Responded to four on-site emergencies and to requests for information related to 45 other acute events;

- Participated in a simulated hazardous substance emergency involving about 60 participants, with approximately 400 representatives from federal, state, and local agencies and organizations observing; and
- Participated in ten small-scale simulations of hazardous material events.

ATSDR initiated 13 new human health studies, continued 50, and completed 6. These studies included comprehensive health studies to evaluate the relationship between exposures to hazardous substances and adverse health effects (8 new studies, 16 continued, and 3 completed). These studies also included health outcome studies (5 new studies, 34 continued, and 3 completed).

ATSDR continued to update and maintain the National Exposure Registry files. During the fiscal year, 2 sites were added to the benzene subregistry, 13 sites to the trichloroethylene (TCE) subregistry, and 4 sites to the dioxin subregistry. In addition, the technical and registrant reports of the TCE Baseline Data were published.

ATSDR conducts surveillance of human health effects resulting from exposure to hazardous substances. As a part of the ATSDR comprehensive surveillance plan, three site-specific projects were continued and one was initiated in FY93. Also, three state-based surveillance projects were continued, and the Hazardous Substances Emergency Events Surveillance System was expanded from 11 to 12 states.

In compliance with CERCLA Section 104(i)(3), which requires ATSDR to prepare toxicological profiles on the 275 most hazardous substances found at Superfund sites, ATSDR produced 12 draft profiles during FY93. ATSDR also continued the substance-specific data gaps research program in cooperation with the Minority Health Professions Foundation.

ATSDR offers funding and assistance to state health departments for developing educational materials and activities in environmental medicine for health professionals. More than 5,000 health providers were trained through these CAs.

A total of 17 CAs with states for education of health professionals were operational in 1993, and

six risk communication workshops were conducted through the CA vehicle. ATSDR also distributed more than 69,000 copies of *Case Studies in Environmental Medicine* to health professionals. Approximately 5,000 health professionals received credit for their participation in the case studies program, which was reviewed and accepted for credit by the American Academy of Family Physicians, the American College of Emergency Physicians, the American Osteopathic Association, the American Association of Occupational Health Nurses, and the American Board of Industrial Hygiene. Seven case studies were published in the *Journal of the American Family Physician*.

Also, nine case studies in environmental medicine were produced in FY93: *Taking an Exposure History*, *Toluene Toxicity*, *Benzene Toxicity*, *Skin Lesions and Environmental Exposures--Rash Decisions*, *Chlordane Toxicity*, *Cholinesterase-Inhibiting Pesticides*, *Pentachlorophenol Toxicity*, *1,1,1-Trichloroethane Toxicity*, and *Reproductive and Developmental Hazards*.

National Institute of Environmental Health Sciences

NIEHS uses CERCLA funds to support its Superfund Research Program and its Worker Training Program. The NIEHS Superfund Basic Research Program, now in its eighth year, continues to provide research and training grants for coordinated, multicomponent, interdisciplinary studies aimed at identifying and reducing the adverse health effects of exposure to hazardous waste. The program's primary objectives are to expand the base of scientific knowledge, reduce the amount and toxicity of hazardous substances in the environment, and ultimately prevent adverse human health effects. Research sponsored in the fields of ecology, engineering, and hydrogeology are integrated into biomedical research programs, designed to provide a broad and detailed body of scientific information. This information will be used by local, state, and federal agencies; private organizations; and industry in making decisions related to the management of hazardous substances.

In FY93, 18 research programs encompassing more than 142 individual research projects were conducted. The following are examples of fiscal year

research:

- The research program at Texas A&M University is developing a comprehensive biological/toxicological and chemical testing protocol that can be used to evaluate the potential toxicity of two major classes of chemical waste: petrochemical waste and wood-preserving waste. These substances and related compounds are being ranked based on their toxicity. The development of this ranking system is an important advance for assessing the risk posed by hazardous waste.
- Researchers at Michigan State University are collaborating with colleagues at the University of Michigan and Purdue University in an effort to better understand the potential health hazards of chemicals contaminating ground water and soils at hazardous waste sites. Researchers have developed new clay-based materials for removing dissolved contaminants from water. These clays represent a fundamental advance in waste-site liner technology that is technically and economically feasible and has the potential of reducing human exposure to toxic substances.
- Researchers at the University of North Carolina are developing biomarkers of exposure and genetic effects as an index of individual exposure to carcinogens. The hydrogeologic and ecological factors that contribute to the variance in human population exposure are being investigated as well. The understanding gained through this research provides a scientific basis for prioritizing chemicals on the basis of the threat they pose to human health and, consequently, helps determine the extent to which Superfund sites should be cleaned up. Specific chemicals under investigation have been selected due to their potential for widespread exposure to humans.

In addition to advances in its research program, NIEHS provided occupational safety and health training programs during FY93. NIEHS received \$20 million from FY93 appropriations for its Superfund Worker Training Program, which supports CAs to train workers performing dangerous jobs in the nation's hazardous waste management and

remediation programs. The training was also made available to emergency responders who address uncontrolled hazardous materials releases. Through the competitive awarding of CAs, NIEHS supported the efforts of non-profit organizations in developing curricula, delivering training courses, evaluating program quality, and conducting outreach activities to high-risk populations.

During FY93, the 18 non-profit organizations supported by NIEHS included five university consortia, four labor organizations, three labor management trust funds, one independent public health consortium, and a national community college consortium. Through CAs in FY93, NIEHS worker training awardees presented 2,750 courses to more than 60,000 hazardous waste workers and emergency responders, resulting in almost one million contact hours of training. During the past year, a competitive contract was awarded for the operation of a national information clearinghouse. The clearinghouse will distribute curricula and training materials created by the awardees and publish a monthly newsbrief of program-related information.

During the first six years of the Superfund Worker Training Program (FY87 through FY93), NIEHS supported 18 primary awardees. These awardees, which are non-profit organizations coordinating 70 different institutions, have trained more than 345,000 workers across the country. More than 15,000 classroom and hands-on training courses have been presented, accounting for almost 6 million contact hours of actual training. Through the encouragement of multi-state, university-based consortiums and the development of national non-profit organizations focusing on specific workforce sectors, NIEHS has developed technically proficient curriculum materials and quality-controlled course presentations. The courses have been delivered to hazardous waste workers and emergency responders in every region of the country; they have established national benchmarks for quality worker-safety and health training.

Department of the Interior

Each of the nine bureaus and four territorial elements of the Department of the Interior (DOI)

provides support to the Superfund program, including assistance to the NRT and RRTs. DOI's role in the program focuses on three general areas:

- *Response management*, including RRT assistance activities, incident-specific activities, and NPL site remedial response activities;
- *Emergency response preparedness*, including RRT participation, regional RRT workgroups, and RRT support; and
- *Trust resources/damage assessment*, including coordination of national resource trustee concerns, natural resource damage assessment briefings, and settlements for trustee resources, coordinated with EPA enforcement actions.

DOI is involved in the full range of response and remediation activities on its lands and at its facilities. Whenever feasible, DOI seeks to prevent the generation and acquisition of hazardous waste, including minimizing waste generation through the use of sound waste management practices. DOI manages waste materials responsibly in order to protect the natural resources and the people who live, work, and enjoy its lands and facilities. DOI is committed to moving aggressively toward the clean-up and restoration of contaminated areas under its care.

Department of Justice

The Department of Justice (DOJ) is responsible for all judicial litigation brought under CERCLA. This responsibility includes conducting CERCLA civil judicial litigation, representing EPA in bankruptcy proceedings, prosecuting criminal violations, conducting defensive and appellate litigation, and participating as *amicus curiae* on behalf of EPA, as required to support effective implementation of the statute. In addition, DOJ provides support in negotiating consent decrees (CDs) under Sections 106, 107, and 122 of CERCLA; processes CDs in accordance with approved interagency procedures; prepares and disseminates reports on litigative activities; and keeps EPA informed of other CERCLA actions consistent with the national program. Superfund money provides DOJ with the necessary attorneys, support staff,

expert witnesses, and litigation support vital to the CERCLA enforcement process.

The enforcement efforts of DOJ play a critical role in the overall Superfund program. Successful judicial actions to recover clean-up costs and replenish the Trust Fund, and actions to compel PRPs to conduct cleanup, are integral parts to EPA's enforcement strategy.

Civil litigation efforts in support of the Superfund program have been successful. In the past four years, for example, DOJ filed 562 civil judicial complaints, assessed over \$915 million through cost recovery judgments and settlements, and compelled defendants to undertake various cleanup activities valued at \$2.8 billion. The number of active Superfund cases being litigated rose from 159 cases with 523 parties in FY87 to 453 cases with more than 6,000 parties at the end of FY93.

Department of Labor

Funds appropriated under interagency agreements allow the Occupational Safety and Health Administration (OSHA) to provide EPA with technical assistance in the area of worker safety and health. Superfund legislation requires OSHA to issue specific standards for employees engaged in hazardous waste operations. As mandated by SARA Section 126, OSHA is promulgating a standard for accreditation of training programs for hazardous waste operations.

Programs operated by OSHA or states with OSHA-approved plans are designed to protect workers at Superfund sites. OSHA representatives conduct compliance inspections at sites where remedial actions are underway; provide technical assistance at hazardous waste sites; and assist the NRT and RRTs in preparedness and training activities. As a member of the NRT and the associated RRTs, OSHA assists these teams with completing their annual workplans and conducts audits of response plans. In addition, OSHA issues interpretations of worker health and safety standards and maintains a computerized system for the interpretations and for tracking hazardous waste activity.

National Aeronautics And Space Administration

The National Aeronautics and Space Administration's (NASA's) environmental compliance and restoration program was initiated in FY88 to ensure compliance with statutory environmental requirements. This program provides the means to conduct environmental compliance monitoring, site cleanup, and restoration measures at NASA field installations, government-owned industrial plants, and other locations where NASA is required to contribute to clean-up costs. CERCLA activities are being addressed as part of the program, including studies, assessments, RI/FSs, RDs, and RAs. During FY93, one NASA-owned site was listed on the NPL and a federal facilities agreement was executed to implement clean-up activities. As ongoing studies and assessments progress and pending regulatory reviews are completed at other sites, clean-up activities will continue.

Tennessee Valley Authority

The Tennessee Valley Authority (TVA) is committed to operating and maintaining its facilities and properties in compliance with statutory environmental requirements.

TVA has no facilities listed on the NPL, and none of its facilities have been proposed for listing. TVA, however, is currently involved in two site cleanups under RCRA corrective action. In addition, TVA has commenced a program to evaluate site contamination and remediation beyond that required by regulations. TVA is also involved in research and development projects involving new remediation technologies.

Department of Transportation

The Department of Transportation uses funding from its budget to support CERCLA activities carried out by the Federal Aviation Administration (FAA), the USCG, the Maritime Administration (MARAD), and the Research and Special Programs Administration (RSPA).

- *Federal Aviation Administration:* CERCLA activities of the FAA involve pollution abatement and hazardous waste cleanup at regional facilities.
- *United States Coast Guard:* The USCG supports CERCLA through pollution abatement activities related to the operation of its own facilities.
- *Maritime Administration:* MARAD's activities in support of CERCLA involve testing and cleanup of hydrocarbons in storage tank facilities at Kings Point and other locations.
- *Research and Special Program Administration:* RSPA activities in support of CERCLA requirements include hazardous waste rulemaking and technical support, emergency response training, and hazardous materials/hazardous substances

incident reporting. RSPA also is responsible for implementing a grant program for the states that supports SARA emergency planning and training for accidents and incidents involving hazardous materials.

Department of Veterans Affairs

From FY89 through FY93, the Department of Veterans Affairs (VA) received approximately \$23 million for Superfund cleanup and other construction activity related to hazardous waste. VA may make additional budgetary requests in the future to cover its liability under Superfund. At present, VA has been identified as a relatively small contributor at approximately 15 Superfund sites.